

The Analysis of Information Content towards Greenhouse Gas Emissions Disclosure In Indonesia's Companies

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ABSTRACT

This study aimed to obtain empirical evidence about the influence of ISO 14001 certified Environmental Management System, the existence of environment function, report environment information in accordance with the Global Reporting Initiative version 3.1, the rank of PROPER, firm size, companies' leverage, companies' profitability and type of industry to the extent of greenhouse gas emissions disclosure in Indonesia companies. The population of this study was all of companies listed in Indonesia Stock Exchange (ISX) in 2010 and 2011. Sample consists of companies in agriculture, mining and manufacture sectors that disclosed their greenhouse gas emissions. The total sample was 30 companies, with observation's period is two years so the total sample which be checked was 53 reports. Data analysis was performed with the classical assumption and hypothesis testing that it used regression analysis. The results of this study indicated that the factor of report environment information in accordance with the Global Reporting Initiative version 3.1, the rank of PROPER and firm size had significantly influence to the disclosure of greenhouse gas emissions. Meanwhile, ISO 14001 certified Environmental Management System, existence of environment function, companies' leverage, companies' profitability and type of industry had no significant effect on the disclosure of greenhouse gas emissions in Indonesia. Implication of this research showed that practice of greenhouse gas emissions disclosure was still minimize to fulfil ISO 14064-1 guideline.

Keywords: content analysis, greenhouse gas emissions, disclosure

BACKGROUND

Indonesia is one of the countries that deal with high risk in the global warming. Global warming is caused by the increasing of greenhouse gas emissions in atmospheres which is exceeded from normal standard. To solve it, Indonesia would commit for reducing greenhouse gas emissions in 2020, about 26% with national resource or about 41% with international support (Bappenas, 2010). The policy that was made by Indonesia to support the target of emissions reduction was *Peraturan Presiden 61/2011* and *Peraturan Presiden 71/2011*.

Greenhouse gas emissions disclosure is a kind of voluntary disclosure; therefore not all companies disclose certain information in their report. Besides, researches in Indonesia that specifically examined the disclosure of greenhouse gas emissions are still limited. All this time, researches on the extent of environment disclosure are focused on Corporate Social Responsibility (CSR) disclosure. In another country, several researches tried to analyse the greenhouse gas emissions disclosure, consist of research Rankin et al (2011), Lorenzo et al (2009), and Freedman and Jaggi (2005).

¹ Penulis penanggung jawab

This study aimed to test factors that affect the extent of greenhouse gas emissions disclosure, in terms of ISO 14001 certified Environmental Management System (EMS), the existence of environment function, the report of environment information in accordance with Global Reporting Initiative (GRI) version 3.1, the rank of PROPER, firm size, companies' leverage, and companies' profitability.

THEORITICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

There are four kind of governance systems in institutional governance system theory, that are consist of market governance, corporate governance, joint governance and state governance (Griffiths and Zammuto, 2005). This study used market governance perspective because its characteristics in accordance with efforts to reduce greenhouse gas emissions in Indonesia companies. One of the characteristics is a reliance of minimum compliance standards. Corporations are encouraged to achieve these compliance standards and therefore, these viewed sustainability initiatives as a cost. Climate change issues and reduction of greenhouse gases is ignored. If corporations pursue individual corporate climate change activities, these are a consequence of managerial choice (Griffiths et al, 2007).

Market governance explained that ISO 14001 certified Environmental Management System (EMS), the existence of environment function, the report of environment information in accordance with Global Reporting Initiative (GRI) version 3.1, the rank of PROPER and PROPER that has positive effect to the extent of greenhouse gas emissions disclosure based on ISO 14064-1.

Agency theory has been used in the literature to investigate asymmetric information between principals (shareholders) and agents (management) (Sarens and Abdolmohammadi, 2007). The increasing of agency cost has positive correlation with company's size and leverage because they have higher asymmetric information than manager and also shareholder. To reduce it, companies will disclose more information. Agency theory explains that firm size and companies' leverage have positive effect to the extent of greenhouse gas emissions disclosure.

ISO 14001 Certified Environmental Management Systems

ISO published ISO 14001: 2004 (Mello, 2006) for facilitating, organizing, monitoring, verifying and reporting the implementation of environmental management system in organization. Herremans et al (2009) used environmental management system as proxy to determine whether strategy of the company has conformity with GRI's visions or has internal control system to support the truth of financial statement. The existence of environmental management system indicates that environmental management accounting system serves managerial process and external reporting as response to internal issues to increasing social environment attention, including attention from investors.

The implementation of ISO 14001 certified environmental management system shows that quality of company's management system is capable to provide environmentally friendly products

or green products to consumers (Adams, 2002). ISO 14001 requires company to establish and maintain communication both internally and externally. Research of Rankin et al (2011) showed that the presence of ISO 14001 certified environmental management system had significant impact to the extent and credibility of greenhouse gas emissions disclosure. Based on the description, this study proposes hypothesis as follows:

H₁: ISO 14001 certified environmental management system has positive effect to the extent of greenhouse gas emissions disclosure based on ISO 14064-1.

The Existence of Environment Function

The existence of environment function shows the company's greenhouse gas emissions management attention to improving their environmental reputation (Neu, et al, 1998), especially to the stakeholders. The existence of environment function proves that company's governance realize in the long term organization strategy into the future which capable to minimize the carbon footprint proactively. Therefore, the main purpose of environment function motivates companies to adopt policy, to measure, to practice and to report the greenhouse gas emissions.

Environment function is likely more recognise the importance of greenhouse gas emissions disclosure for reducing their risk, especially the risks that caused by the increasing of regulation and operational activity which have impact on the global warming (Rankin et al, 2011). Moreover, the existence of environmental function is likely more discloses their emissions to the public and provides more credible information (Ash forth and Gibbs, 1990). The study of Rankin et al (2011) showed that the existence of environment function did not find significant effect to the extent and the credibility of greenhouse gas emissions disclosure. Based on the description, this study proposes hypothesis as follows:

H₂: The existence of environment function has positive effect to extent of greenhouse gas emissions disclosure based on ISO 14064-1.

The Report of Environment Information in accordance with Global Reporting Initiative (GRI) Version 3.1

GRI reporting framework has globally been accepted for improving the quality of sustainability report in order to increase transparency, comparability, clarity and other principles. Rankin et al (2011) explained that companies are using GRI guidelines to generate sustainability information in private regulation and it can be used to disclose their greenhouse gas emission in annual report. The adoption of GRI guidelines demonstrated the company's commitment for overcoming the climate change. The study of Rankin et al (2011) found that sustainability information had the significant effect to the extent and credibility of greenhouse gas emissions disclosure. Based on the description, this study proposes hypothesis as follows:

H₃: The Report of environment information in accordance with Global Reporting Initiative (GRI) version 3.1 has positive effect to extent of greenhouse gas emissions disclosure based on ISO 14064-1

Rank of PROPER

In institutional governance system theory, market governance explained that company's involvement on climate change activities as the consequence of voluntary participation in sustainability programs is sponsored by the government. One of the sustainability programs that implemented by ministry of environment is PROPER. There are 5 colours in PROPER assessment, namely gold, green, blue, red, and black. Every ranking has each indicator that must be obeyed by the company. Gold is the highest ranking, while black is the lowest ranking. Companies with the higher rank of PROPER tend to have the more commitment to improve their social and environmental performance. Based on the description, this study propose hypothesis as follows:

H₄: The rank of PROPER has positive effect to extent of greenhouse gas emissions disclosure based on ISO 14064-1

Firm Size

Firm size is often used in previous studies to explain the publication of environment information (Lorenzo et al, 2009). In agency theory, the increasing of agency cost will occur together with the increasing of firm size because of asymmetric information. Besides, large companies get more public attention, so they disclose more environmental information to prevent and to resolve the conflicts (Lorenzo et al, 2009). Liu and Anbumozhi (2009) argued that large company get more public monitoring and they also have superiority resource in environmental management efforts.

By analysing 120 large companies both countries which ratified the Kyoto Protocol and countries which not ratified the Kyoto Protocol. Freedman and Jaggi (2005) found that greenhouse gas emissions disclosure is positively related to the firm size. Their results are similar to study of Rankin et al (2011) and Lorenzo et al (2009), whom also found that firm size was significant effect to the extent of greenhouse gas emissions disclosure. Based on the description, this study proposes hypothesis as follows:

H₅: The Firm Size has positive effect to extent of greenhouse gas emissions disclosure based on ISO 14064-1

Companies' Leverage

Based on agency theory, leverage affect to the information disclosure, especially as the result of the increasing of conflict. Companies with the higher debt have the greater agency costs, because the possibilities of wealth transfer from company's debt to the shareholders. To increase the amount of information disclosure, company can reduce agency costs and minimise their

potential conflicts of interest between owners and creditors. By analysing of agency theory, the research of Rankin et al (2011) found that leverage is positively associated with the extent and credibility of greenhouse gas emissions disclosure.

According to Freedman and Jaggi (2005), the absence of detailed pollution disclosure causes investors and creditors are not capable to evaluate the default risks of company. Therefore, the investors and creditors can't avoid investment in company. Freedman and Jaggi (2005) did not find significant effect between leverage and greenhouse gas emissions disclosure. Same as Freedman and Jaggi (2005), Lorenzo et al (2009) also did not find significant effect between leverage and disclosure of greenhouse gas emissions. Based on the description, this study proposes hypothesis as follows:

H₆: Companies' Leverage has positive effect to the extent of greenhouse gas emissions disclosure based on ISO 14064-1

Companies' Profitability

Environment activities are still considered as the cost of company, so economic performance becomes one of the relevant factors to determine whether the environment activity is company's priority or not (Lorenzo et al, 2009). Firms with the higher economic performance have the greater ability to reduce their emissions. The research of Khanna et al (2004) found positive effect between profitability and the extent of environment disclosure. On the other hand, Neu et al (1998) explains that firms with unfavourable profitability take the advantage of environmental disclosure for legitimacy purpose.

The research of Freedman and Jaggi (2005) did not find significant effect between profitability and greenhouse gas emissions disclosure. Meanwhile, the research of Lorenzo et al (2009) found that ROA had no significant effect to the disclosure of greenhouse gas emissions, but ROE had significant effect to the disclosure of greenhouse gas emissions. Based on the description, this study proposes hypothesis as follows:

H₇: Companies' Profitability has positive effect to the extent of greenhouse gas emissions disclosure based on ISO 14064-1

RESEARCH METHODS

The extent of greenhouse gas emissions disclosure was measured by index based on ISO 14064-1. Measurement was determined by the score of company's information disclosure that compared with the score of disclosures which was developed from ISO 14064-1. Measurement of ISO 14001 certified environmental management system was determined by the quality of environmental management system. The rank of environmental management system and the value of each rank were classified into 4 categories. Measurement of the existence of environment function was performed by assessing on how the position of environment functions in a company.

The indicator is the existence of environment function, either inside position in management hierarchy or outside the management hierarchy (person responsible of environment activity). Measurement of environment information reporting was determined by the score of environment information that was disclosed by company, and be compared with score of environment performance based on GRI version 3.1. In PROPER rating system, performance appraisal result is demonstrated by colour according to the rate of performance. There are 5 ratings with 5 colours categories: gold, green, blue, red, and black. Gold indicates the highest ranking, whereas black indicates the lowest ranking. Firm size indicates the total assets of company at the year ended. Firm size was obtained from data of total assets in Trillion rupiah. Leverage measured how much assets were financed by debt. ROI measured profitability of the company.

Sample Selection Method

In this study, sample selection was conducted by random sampling method using the following criteria:

1. The companies can reduce greenhouse gas emissions and they also have obligation to carry out corporate social responsibility. The companies consisted of mining, agriculture, forestry and manufacture. The companies' selection based on *Peraturan Presiden 61/2011*, *Peraturan Presiden 71/2011*, *Undang-Undang 40/2007* and *Peraturan Pemerintah 47/2012*.
2. Companies published the annual report or the sustainability report in 2010 and 2011.
3. The company would be selected if they disclose greenhouse gas emissions either explicitly or implicitly (company minimally disclosed one of the gases that produce greenhouse emissions or one of policy that related to greenhouse gas emissions).

Multiple Regression Analysis

The regression equated was used in this study as the following form:

$$\text{EMD} = \alpha + \beta_1 \text{EMS} + \beta_2 \text{ENV_FU} + \beta_3 \text{GRI} + \beta_4 \text{PROPER} + \beta_5 \text{SIZE} + \beta_6 \text{LEV} + \beta_7 \text{ROI} + \beta_8 \text{IND} + e$$

Explanation:

EMD	= The extent of greenhouse gas emissions disclosure based on ISO 14064-1
α	= Constants
EMS	= ISO 14001 certified Environmental Management System
ENV_FU	= The existence of environment function
GRI	= The Report of environment information in accordance with Global Reporting Initiative (GRI) version 3.1
PROPER	= The Rank of PROPER
SIZE	= Firm Size
LEV	= Companies' Leverage
ROI	= Companies' Profitability

IND = Type of Industry

e = Standard error

RESULT AND ANALYSIS

Based on random sampling method, there are 30 companies according to sample selection criteria. The observation period is two years (2010 and 2011) then there are 53 reports (both annual reports and sustainability reports) that will be observed. Detail explanation of initial sample shows in Table 1.

Table 1
Population and Sample of Research

Explanation	Total
Total of agriculture, mining and manufacturing companies which published their reports (both annual report and sustainability report) in 2010 and 2011	149
Total of companies did not disclose greenhouse gas emissions in their report	(119)
Total of sample according to sample selection criteria	30

Source: Secondary data (processed, 2012)

Descriptive statistic aims to provide the description of data that can be seen from average (mean), median, standard deviation, minimum and maximum value. Descriptive statistic result is presented in Table 2.

Table 2
Descriptive Statistic

	N	Min	Max	Mean	Median	Std.Deviation
EMD	53	0.0072	0.5206	0.107585	0.0658	0.1213564
EMS	53	0	3	2.3396	3	1.12563
ENV_FU	53	1	4	1.6981	2	0.86791
GRI	53	0.10	1.00	0.4436	0.30	0.28801
PROPER	53	0.00	4.50	2.6445	3	1.43735
SIZE*	53	62	153.52	20.527	12.48	26.68069
LEV	53	0.13	0.71	0.44	0.5	0.16702
ROI	53	-3.49	41.56	12.9920	12.39	10.53443
IND	53	1	5	2.8113	3	1.17762

* in trillions rupiah

Source: Secondary data (processed, 2012)

Table 2 shows the amount of observations in this study (N) is 53 observations. Table 4.2 also demonstrates the minimum value, maximum value, average value (mean), median and standard deviation for each variable.

For the value of greenhouse gas emissions disclosure (EMD) with 53 samples, the mean value of EMD is 0.107585. The average (mean) is 0.107585 it higher than median value, 0.0658 which indicated the EMD was high. For the minimum value is 0.0072 and the maximum value is 0.5206 which the range for the minimum value to maximum value is 0.5134. While the standard

deviation is 0.1213564, less than the mean value, it shows the extent of greenhouse gas emissions disclosure for each company was low during the period of observation.

Result of Hypothesis Test and Discussion

The determination coefficient or Adjusted R Square regression model is 0.566, it means that the variation of dependent variable could be explained of 56.6% by all free variables in regression model. Besides, test of ANOVA (F-Test) shows that the value of F-counted is 6.387 with p-value of 0.000 less than or < 0.05 . Based on result of Adjusted R Square and F-Test could be concluded that all of independent variables influent together significantly to dependent variable. Table 4.8 is test result of each independent variable that was suspected in affecting to the extent of greenhouse gas emissions disclosure, namely ISO 14001 certificate of Environmental Management System (EMS), the existence of environment function (ENV_FU), the report of environment information in accordance with Global Reporting Initiative version 3.1 (GRI), the rank of PROPER (PROPER), firm size (SIZE), companies' leverage (LEV), companies' profitability (ROI) and type of industry (IND).

Table 3
Regression Test Result

Variable	Sig. ($\alpha = 5\%$)
EMS	0.79
ENV_FU	0.123
GRI	0.004*
PROPER	0.031*
SIZE	0.000*
LEV	0.905
ROI	0.602

** significant in 5%*

The first hypothesis testing, it was indicated that environmental management system had positive effect and not significant to the extent of greenhouse gas emissions disclosure. The test result did not accordance with institutional governance system theory. It is possible because of increasing the quality of environmental management system does not motivate company to expand their disclosure of greenhouse gas emissions. Certificate of ISO 14001 indicates to the public that company has good environmental management system. Therefore, the positive image of ISO 14001 tends to decline the management motivation to expand their disclosure of greenhouse gas emissions. Besides, ISO 14001 does not directly require the management of greenhouse gas emissions, so if company want to reduce their greenhouse gas emissions, they must allocate the additional fee.

The second hypothesis testing indicated that the existence of environment function had negative effect and not significant to the extent of greenhouse gas emissions disclosure. This finding is consistent with study of Rankin et al (2011) in Australia. In Indonesia, environment function does not independently focus on not only handling environment issues, but also holding the position with other issues such as HSE (Health, Safe and Environment), QSE (Quality, Safe and Environment), CSR (Corporate Social Responsibility), partnerships and community development and other various environment functions. There is a tendency that environment function with higher position in organization will increase their tasks and responsibility. Therefore, the disclosure of greenhouse gas emissions is not prioritized by the company.

The third hypothesis testing indicated that the report of environment information in accordance with Global Reporting Initiative had positive effect and significant to the extent of greenhouse gas emissions disclosure. This finding is consistent with study of Rankin et al (2011) in Australia. The test result of GRI variable according to market governance in institutional governance system theory. Corporate volunteerism uses Global Reporting Initiative guidelines for generating sustainability information. Implementation of Global Reporting Initiative in sustainability report indicates companies' initial commitment to proactively reduce greenhouse gas emissions. Evidently, one of the environment performance assessments in Global Reporting Initiative (GRI) is emissions, effluents and waste. The assessment also requires the disclosure of greenhouse gas emissions, either directly or indirectly, initiative to reduce greenhouse gas emissions and its achievement.

The fourth hypothesis testing indicated that rank of PROPER had negative effect and significant to the extent of greenhouse gas emissions disclosure. The test result of PROPER is not accordance with institutional governance system theory. Increasing of PROPER precisely reduces the companies' motivation to expand their greenhouse gas emissions disclosure. It is occurs because higher rank of PROPER indicates to the stakeholders that company has better environment performance. PROPER with high ranking (Gold and Green ranking) requires company's operational activities to minimize their greenhouse gas emissions especially in assessment of air quality and energy using. High rank of PROPER publication indirectly represents the companies' commitment for overcoming the climate change.

The fifth hypothesis testing, it indicated that firm size had positive effect and significant to the extent of greenhouse gas emissions disclosure. The result is consistent with the research of Rankin et al (2011), Lorenzo et al (2009) and Freedman and Jaggi (2005). Test result of firm size to the extent of greenhouse gas emissions disclosure based on ISO 14064-1 in accordance with agency theory. The increasing of firm size positively correlates with agency cost. Large companies have higher agency cost so they must expand their disclosure to avoid conflict. Moreover, greenhouse gas emissions come from company's operating activity so companies with larger size will increase their emission. Therefore, large company should minimize their greenhouse gas

emissions through design of operation activities with lower emission and design of CSR activities that capable to reduce or absorbs the greenhouse gas emissions. To achieve it, companies need many resources. Firm with larger size will increase their capability to allocate company's resources for reducing greenhouse gas emissions.

The sixth hypothesis testing indicated that leverage had positive effect and not significant to the extent of greenhouse gas emissions disclosure. The result was consistent with research of Lorenzo et al (2009). Company with higher financial risk will increase their agency cost because of interest conflict. As result, companies will be cautious to expand their disclosure. Disclosure just occurs when it has the ability to build company's reputation; otherwise if the disclosure creates risk to the company's reputation, the disclosure will be avoided. The mistake of disclosure in company with higher leverage can undermine the trust of stakeholders. The disclosure of Greenhouse Gas emissions requires high cost so the company with higher financial risk unable to disclose it. Cost efficiency is needed to decrease their leverage. Therefore, the extent of greenhouse gas emissions disclosures must be adjusted with company's financial capacity.

The seventh hypothesis testing, it indicated that profitability had positive effect and not significant to the extent of greenhouse gas emissions disclosure. The result was consistent with researches of Rankin et al (2011), Lorenzo et al (2009), and Freedman and Jaggi (2005). Neu et al (1998) finds that company with unfavourable profitability is precisely take advantage of environment disclosure for legitimacy purpose. In contrary, companies with favourable profitability do not necessary to expand their environment disclosure because they are fear that the disclosure can disturb the information of company's financial success.

CONCLUSION

Based on regression test result showed that report of environment information in accordance with Global Reporting Initiative version 3.1 (GRI), rank of PROPER (PROPER) and firm size (SIZE) had significant effect to the extent of greenhouse gas emissions disclosure based on ISO 14064-1. While variable of ISO 14001 certified environmental management system (EMS), the existence of environment functions (ENV_FU), companies' profitability (ROI), companies' leverage and type of industry (IND) had no significant impact to the extent of greenhouse gas emissions disclosure.

This study has some limitations. *First*, this study only covered two years (2010 and 2011) after adopted ISO 14064-1 in 2009. Besides, the publication of national action plan for reducing greenhouse gas emissions recently passed in 2011, so to observe the latest trend of greenhouse gas emissions disclosure was only used companies' data in 2010 and 2011. *Second*, there was high disparity to the extent of greenhouse gas emissions disclosure among companies in Indonesia. The high disparity occurs because the disclosure of greenhouse gas emissions is type of voluntary

disclosure. *Third*, developing of the index based on ISO 14046-1 directly refers to study of Rankin et al (2011), without adjustment with disclosure condition in Indonesia companies.

Based on the limitations of the research, then some suggestions are proposed as input for further research. *First*, future research is better to longer time series analysis. It can be done by comparing the disclosures before regulation and after regulation about greenhouse gas emissions. *Second*, addition of other independent variables can explain the extent of greenhouse gas emissions disclosure. *Third*, the developing of greenhouse gas emission disclosure index based on ISO 14064-1 according to disclosure condition in Indonesia.

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